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DICKSTEIN SHAPIRO LLP
1177 AVENUE OF THE AMERICAS 6TH AVENUE
NEW YORK, NY 10036-2714

EXAMINER	
REGO, DOMINIC E	

ART UNIT	PAPER NUMBER
2618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/750,924	JALLOUL ET AL.	
	Examiner	Art Unit	
	Dominic E. Rego	2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13 and 15-23* is/are rejected.

7)☒ Claim(s) *2 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04/14/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122).*

Regarding claims 1 and 13, Shin teaches a method/system for calculating signal-to-interference ratio (SIR) of a mobile device in a wireless communication system *(abstract)*, the method comprising the steps of:

non-coherently processing a communication signal transmitted by the mobile device *(Paragraph 0004: Shin teaches received signal consists of a desired signal and interference)*;

estimating interference power of the communication signal *(Paragraph 0005: Shin teaches the interference power is estimated by measuring total power of the received signal)*;

subtracting the scaled estimated interference power from the processed communication signal to thereby estimate signal power *(Paragraph 0005: Shin teaches*

the interference power is estimated by measuring total power of the received signal and then subtracting the estimated signal power from the total power); and

calculating the SIR by dividing the estimated signal power by the estimated interference power *(Paragraph 0005: Shin teaches the SIR is then determined as the ratio between the estimated signal power and interference power),* except for scaling the estimated interference power.

However, in related art, Lindoff teaches the method/system comprising the steps of scaling the estimated interference power *(Paragraph 0030 and 0031).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method/system comprising the steps of scaling the estimated interference power, as taught by Lindoff, in the Shin systems in order to reduce the interference of signal received by the base station.

3. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* and further in view of Okawa et al. *(US Patent Application Publication #20030031195).*

Regarding claims 3 and 15, the combination of Shin and Lindoff teach all the claimed elements in claims 1 and 13, except for the method/system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols.

However, in related art, Okawa teaches the method/system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols *(Paragraphs 0036-0039, 0086)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method/system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols, as taught by Okawa, in the combination of Shin and Lindoff system in order to improve the fading tracking ability in the transmission power control because of the virtually reduced transmission power control period *(Okawa, Paragraph 0086)*.

Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* and further in view of Zhou et al. *(US Patent #6,370,130)*.

Regarding claims 4 and 16, the combination of Shin and Lindoff teach all the claimed elements in claim 1 and 13, except for the method/system, wherein the interference power is estimated based on pilot symbols and TPC symbols.

However, in related art, Zhou teaches the method, wherein the interference power is estimated based on pilot symbols and TPC symbols *(Claim 10)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method, wherein the

interference power is estimated based on pilot symbols and TPC symbols, as taught by Zhou, in the combination of Shin and Lindoff system in order to improve the signal power.

Claims 5,6,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* and further in view of Ha *(US Patent #20010019577).*

Regarding claims 5,6,17 and 18, the combination of Shin and Lindoff teach all the claimed elements in claim 1 and 13, except for the method/system wherein the step of estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols.

However, in related art, Ha teaches the method/system wherein the step of estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols *(Paragraph 0039: Ha teaches if there is no interference, there is no difference between the two symbols theoretically. Therefore, subtracting the two neighboring symbols from each other and then squaring the subtracted results provides 0. Otherwise, if there exists interference, subtracting the two neighboring symbols from each other and then squaring the subtracted results does not provide 0).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method/system wherein the

step of estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols, as taught by Ha, in the combination of Shin and Lindoff system in order to produce interference power.

Claims 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* in view of Ha *(US Patent #20010019577),* and further in view of Stott et al. *(US Patent #6,320,915).*

Regarding claim 7, the combination of Shin, Lindoff, and Ha teach all the claimed elements in claim 5, except for the method wherein the step of estimating the interference power includes a step of high-pass filtering symbols.

However, in related art, Stott teaches the method wherein the step of estimating the interference power includes a step of high-pass filtering symbols *(Col 5, line 18-23).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method wherein the step of estimating the interference power includes a step of high-pass filtering symbols, as taught by Stott, in the combination of Shin, Lindoff, and Ha system in order to remove interference from the signal substantially.

4. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* and further in view of Hayashi et al. *(US Patent Application Publication #20040266469).*

Regarding claims 8,19, and 23, Shin teaches in a wireless communication system having a base station and a mobile device, a method/system for adjusting power settings of the mobile device comprising the steps of:

calculating signal-to-interference ratio (SIR) of communication signals transmitted to the base station by the mobile device *(abstract)*, the calculating step including:

non-coherently processing a communication signal transmitted by the mobile device *(Paragraph 0004: Shin teaches received signal consists of a desired signal and interference)*;

estimating interference power of the communication signal *(Paragraph 0005: Shin teaches the interference power is estimated by measuring total power of the received signal)*;

subtracting the scaled estimated interference power from the processed communication signal to thereby estimate signal power *(Paragraph 0005: Shin teaches the interference power is estimated by measuring total power of the received signal and then subtracting the estimated signal power from the total power)*; and

calculating the SIR by dividing the estimated signal power by the estimated interference power *(Paragraph 0005: Shin teaches the SIR is then determined as the*

ratio between the estimated signal power and interference power), except for scaling the estimated interference power.

However, in related art, Lindoff teaches the method comprising the steps of scaling the estimated interference power *(Paragraph 0030 and 0031).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the method comprising the steps of scaling the estimated interference power, as taught by Lindoff, in the Shin systems in order to reduce the interference of signal received by the base station.

The combination of Shin and Lindoff teach all the claimed elements in claim 1, except for comparing the calculated SIR with a target SIR to thereby generate a power control signal; transmitting the power control signal from the base station to the mobile phone; and adjusting the power of the communication signals transmitted by the mobile phone based on the power control signal.

However, in related art, Hayashi teaches comparing the calculated SIR with a target SIR to thereby generate a power control signal; transmitting the power control signal from the base station to the mobile phone; and adjusting the power of the communication signals transmitted by the mobile phone based on the power control signal *(Paragraph 0012).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of comparing the calculated SIR with a target SIR to thereby generate a power control signal; transmitting the power control signal from the base station to the mobile phone; and adjusting the power of the

communication signals transmitted by the mobile phone based on the power control signal, as taught by Hayashi, in the combination of Shin and Lindoff system in order to mutually adjust the transmission powers by the TPC, and are operated so as to always maintain the optimal transmission powers *(Paragraph 0012)*.

Note: This is inherent in the communication system to have a temporary memory/buffer to store processed signals, scale estimated interference power, estimated signal power, and calculated SIR.

5. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122) in view of* Hayashi et al. *(US Patent Application Publication #20040266469)* and further in view of Okawa et al. *(US Patent Application Publication #20030031195)*.

Regarding claims 9 and 20, the combination of Shin, Lindoff, and Hayashi teach all the claimed elements in claim 8 and 19, except for the system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols.

However, in related art, Okawa teaches the system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols *(Paragraphs 0036-0039, 0086)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the system wherein signal power is estimated based on pilot symbols and any one or more of TPC, TFCI, and FBI symbols, as taught by Okawa, in the combination of Shin, Lindoff, and Hayashi system in order to improve the fading tracking ability in the transmission power control because of the virtually reduced transmission power control period *(Okawa, Paragraph 0086)*.

Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* in view of Hayashi et al. *(US Patent Application Publication #20040266469)* and further in view of Zhou et al. *(US Patent #6,370,130)*.

Regarding claims 10 and 21, the combination of Shin, Lindoff, and Hayashi teach all the claimed elements in claims 8 and 19, except for the system, wherein the interference power is estimated based on pilot symbols and TPC symbols.

However, in related art, Zhou teaches the system, wherein the interference power is estimated based on pilot symbols and TPC symbols *(Claim 10)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the system, wherein the interference power is estimated based on pilot symbols and TPC symbols, as taught by

Zhou, in the combination of Shin, Lindoff, and Hayashi system in order to improve the signal.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122)* in view of Hayashi et al. *(US Patent Application Publication #20040266469)* and further in view of Ha *(US Patent #20010019577).*

Regarding claims 11 and 12, the combination of Shin, Lindoff, and Hayashi teach all the claimed elements in claim 8, except for the system wherein the step of estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols.

However, in related art, Ha teaches the system wherein the step of estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols *(Paragraph 0039: Ha teaches if there is no interference, there is no difference between the two symbols theoretically. Therefore, subtracting the two neighboring symbols from each other and then squaring the subtracted results provides 0. Otherwise, if there exists interference, subtracting the two neighboring symbols from each other and then squaring the subtracted results does not provide 0).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the system wherein the step of

estimating the interference power includes a step of calculating a difference between adjacent symbols and also a square of the different between adjacent symbols, as taught by Ha, in the combination of Shin, Lindoff, and Hayashi system in order to produce interference power.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. *(US Patent Application Publication #20040093178)* in view of Lindoff et al. *(US Patent Application Publication #20050075122).*

Regarding claim 22, Shin teaches a wireless communication system having a base station and a mobile device, comprising:

a processor *(inherent in the system)*;

a memory communicatively coupled to the processor *(inherent in the system);*

software executing in the processor configured to:

non-coherently process a communication signal transmitted by the mobile device *(Paragraph 0004: Shin teaches received signal consists of a desired signal and interference)*;

store the processed communication signal in the memory *(Since the base station and mobile station always contain memory/buffer which store the processed communication signal in the memory, so it's inherent);*

estimate interference power of the communication signal *(Paragraph 0005: Shin teaches the interference power is estimated by measuring total power of the received signal)*;

store the estimated interference power in the memory *(Since the base station and mobile station always contain memory/buffer which store the estimated interference power in the memory, so it's inherent);*

subtract the scaled estimated interference power from the processed communication signal to thereby estimate signal power *(Paragraph 0005: Shin teaches the interference power is estimated by measuring total power of the received signal and then subtracting the estimated signal power from the total power)*;

store the scaled estimated signal power in the memory *(inherent)*; and

calculate the SIR by dividing the estimated signal power by the estimated interference power (Paragraph 0005: Shin teaches the SIR is then determined as the ratio between the estimated signal power and interference power), except for scaling the estimated interference power.

However, in related art, Lindoff teaches the method/system comprising the steps of scaling the estimated interference power *(Paragraph 0030 and 0031)*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teaching of the system comprising the steps of scaling the estimated interference power, as taught by Lindoff, in the Shin systems in order to reduce the interference of signal received by the base station.

Allowable Subject Matter

6. Claims 2 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 2 and 14, the prior art of record fails to teach the method/system, wherein the step of non-coherently processing includes the steps of:

multiplying a portion of the communication signal by a pilot symbol sequence in each finger of a receiver to produce a respective multiplied signal;

calculating an average of the multiplied signal over a length of the pilot symbol sequence in each of the fingers of the receiver;

squaring the respective averages in the fingers of the receiver; and

adding the squares of the fingers of the receiver.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hwang (US Patent Application Publication #20040127213) teaches apparatus for recognizing mobile signals in mobile communication system, and method therefor.

Rainbolt et al. (US Patent Application Publication #20050037712) teaches interference estimation and scaling for efficient metric storage and interference immunity.

Sourour (US Patent #6865218) teaches multipath interference reduction for a CDMA system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dominic E. Rego whose telephone number is 571-272-8132. The examiner can normally be reached on Monday-Friday, 8:30 am-5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dominic E. Rego

PHILIP J. SOBUTKA
PATENT EXAMINER